

Abstract

To provide a light control device including a liquid crystal element which does not need a polarizing plate and an alignment layer and is compact and high in contrast ratio, and can be driven at low applied voltage and can exhibit stable performance even if environmental temperature varies, and a driving method for the light control device, as well as an image pickup apparatus using the light control device.

5 A liquid crystal cell (1) is fabricated by injecting a mixture in which liquid crystal, a polymer precursor, and a polymerization initiator into an empty cell constituted by two transparent substrates (8) which are stuck together with a gap of 4-11  $\mu\text{m}$  and on each of whose opposed surfaces a

10 transparent electrode (9) is formed, and the polymer precursor is polymerized and then a random three-dimensional network polymer (3) is formed in the continuous layer of liquid crystal (2). The liquid crystal cell (1) is driven by applying a voltage according to the environmental temperature. When

15 driving voltage is off, the liquid crystal molecules (2) are aligned along the wall surfaces of the polymer (3), the network polymer (3) forms light scattering interfaces, on the other hand, when driving voltage is on, the liquid crystal molecules are oriented in a predetermined direction with respect to the

20 electric field, so that the refractive index becomes constant in the traveling direction of light, whereby incident light (5) passes through without being scattered.

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